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10/749,816	12/30/2003	Andreas Bibl	09991-150001	9369

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FISH & RICHARDSON PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER

HSIEH, SHIH WEN

ART UNIT PAPER NUMBER

2861

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/749,816

Applicant(s)

BIBL ET AL.

Examiner

Shih-wen Hsieh

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 15-31 is/are rejected.
- 7) ☒ Claim(s) 13 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2-13-06.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Response to Amendment

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8, 12, 15, 16, 18-22, 25 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Su et al. (US Pat. No. 6,132,028, from IDS dated Feb. 13, 2006).

In regard to:

Claim 1:

Su et al. teach in their figs. 8 and 9:

A drop ejector, comprising:

a flow path (from 22 to 44, figs. 1-3, fig. 3 is one of the embodiment with orifice plate arrangement as shown in figs. 3 and 4; figs. 8 and 9 is another embodiment, however, the pressurized flows are the same in both embodiments) in which fluid is pressurized to eject drops from a nozzle opening (42) in a plane (the plane of orifice plate 14'), and proximate the nozzle opening, a plurality of projections (84) extending from the plane of the nozzle opening, refer to col. 4, line 42 to col. 5, line 4.

Claim 2:

Su et al. further teach:

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wherein the nozzle opening is surrounded by projections (84), refer to fig. 8.

Claim 3:

Su et al. further teach:

wherein the projections are posts (84). Note: a post is just a piece of structure such as an electric post or a flag post,. Su et al.'s ridge is just a post oriented horizontally.

Claim 4:

Su et al. further teach:

wherein the projections are wall-shaped, refer to fig. 9, those raised ridges 84 are wall-shaped.

Claim 5:

Su et al. further teach:

wherein the projections are arranged in a pattern, refer to fig. 8.

Claim 6:

Su et al. further teach:

wherein the pattern defines an array of rows and columns, refer to fig. 8, where the ridges in the left-and-right direction are in rows, and the ridges in the top-to-bottom direction fare in columns.

Claim 7:

Su et al. further teach:

wherein the pattern defines an arc, refer to fig. 8 for the arc.

Claim 8:

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Su et al. further teach:

wherein the pattern defines concentric ink-collection spaces, refer to col. 4, lines 46-51.

Claim 12:

Su et al. further teach:

wherein the number of the projections is four or greater, refer to figs. 8 and 9 for the numbers of ridges.

Claim 15:

Su et al. further teach:

wherein the height of the projections is above the plane of the nozzle opening, refer to fig. 9.

Claim 16:

Su et al. further teach:

wherein the nozzle opening and projections are defined in a common body, refer to fig. 9, the common body is the orifice plate (14').

Claim 18:

Su et al. further teach:

a channel (22, fig. 2) proximate the projections. Note: arrangements on top of the orifice plate are different from embodiment to embodiment. However, the arrangement such as layers 20, and 12, etc. below the orifice plate are the same for all of the embodiments.

Claim 19:

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Su et al. further teach:

a vacuum source or wicking material proximate the projections, refer to col. 4, lines 46-50, the capillaries formed by the ridges are the vacuum sources.

Claim 20:

Su et al. further teach:

wherein the nozzle opening is disposed in a well (86, Su et al. called it "annular zone) and the well includes said projections (86), refer to fig. 8.

Claim 21:

Su et al. further teach:

wherein the nozzle opening is disposed on a platform and the projections are disposed proximate the platform. Note: the platform in Su et al.'s invention can be considered as the orifice plate (14'), refer to figs. 8 and 9.

Claim 22:

Su et al. further teach:

a plurality of nozzle openings and a plurality of projections proximate each of the nozzle openings said nozzle openings and said projections defined in a common body. Note: nozzle in figs. 8 and 9 just show one nozzle, actually, the nozzles are just like those shown in figs. 1 and 6.

Claim 25:

A drop ejector comprising:

a flow path in which fluid is pressurized for ejection through a nozzle opening in a plane, and proximate said nozzle opening, at least four posts extending from the plane

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of said nozzle opening, said posts and said nozzle opening being defined in a common body.

Rejection:

This claim is a combination of claims 1, 3 and 16 and is rejected on the basis as set forth for these claims discussed above.

Claim 28:

A method of fluid ejection, comprising:

providing a printhead including a flow path in which fluid is pressurized for ejection through a nozzle opening in a plane, and proximate the nozzle opening, a plurality of projections extending from the plane of the nozzle opening, the projections defining a space transverse to the nozzle opening,

providing a fluid that is wicked by capillary forces into the space defined by said projections, and

ejecting said fluid through said nozzle opening by pressurizing said fluid in said flow path.

Rejection:

This method claim corresponds to the apparatus claim, claim 1, and the steps in this method claim are deemed to be made inherent by the functions of the structure in the combination discussed above for claim 1. The space in this claim is the space between each of the ridges and the orifice plate.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action: .

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 9-11, 17, 23, 24, 26, 27 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Su et al.

In regard to:

Claim 9:

The device of Su et al. DIFFERS from claim 9 in that it does not teach:

wherein the projections have a width that is about twice the nozzle opening width or less.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to select a width of the ridges to achieve a design purpose, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, refer to MPEP 2144.05 II B.

Claim 10:

Su et al. further teach:

a perimeter of the nozzle opening (refer to fig. 8) and a nozzle opening width (refer to fig. 8, the width is actually the diameter of the nozzle opening).

However, the device of Su et al. DIFFERS from claim 9 in that it does not teach: further comprising the nozzle opening having a perimeter and a nozzle opening width, wherein the projections are no closer to the perimeter of the nozzle opening than about 20% of the nozzle opening width.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to select a distance of the ridges with respect to the perimeter of the nozzle opening, since it has been held that discovering an optimum value of a result effective variable, such as 20% or less, involves only routine skill in the art, refer to MPEP 2144.05 II B.

Claim 11:

The drop ejector of claim 1 wherein the spacing between projections is about twice the nozzle width or less.

Rejection:

This claim is rejected on the basis as set forth for claims 9 and 10 discussed above.

Claim 17:

Su et al. teach the material of the orifice plate is metal, refer to col. 4, lines 4-6. However, a silicon material is often used as the material for the orifice plate, refer to MPEP 2144.07

Claim 23:

The drop ejector of claim 1 wherein the nozzle opening width is about 200 micron or less.

Rejection:

This claim is rejected on the basis as set forth for claims 9-11, refer to MPEP 2144.05 II B.

Claim 24:

Su et al. teach a firing resistor (30, fig. 3) to fire an ink droplet. However, piezoelectric actuator as recited in this claim is also widely used in ink jet printer to fire ink droplet, refer to MPEP 2144.03, In re Malcolm, 129 f.2d 529, 54 USPQ 235 (CCPA 1942).

Claims 26 and 27:

The drop ejector of claim 25 wherein the spacing between said posts is about 10% of the nozzle opening width or greater and twice the nozzle opening width or less (claim 26); and

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The drop ejector of claim 25 wherein the posts have a width that is about twice the nozzle opening or less.

Rejection:

These two claims are rejected on the basis as set forth for claims 9 and 10 discussed above, refer to MPEP 2144.05 II B.

Claims 29 and 30:

The method of claim 28 wherein the fluid has a surface tension of about 20-50 dynes/cm (claim 29); and

The method of claim 28 wherein the fluid has a viscosity of about 1 to 40 centipoises (claim 30).

These two claims are related to a selecting properties of the fluid in a certain range, therefore they are rejected on the basis of MPEP 2144.05 II A.

Claim 31:

A drop ejector, comprising:

A flow path in which fluid is pressurized to eject drops from a nozzle opening in a plane, and proximate the nozzle opening, a plurality of projections extending from the plane of the nozzle opening, wherein the nozzle opening and projections are defined in a common body fabricated from a silicon material and wherein the nozzle opening is disposed on a platform and the projections are disposed proximate the platform.

Rejection:

This claim is a combination of claims 1, 16, 17 and 21, and is rejected on the basis as set forth for those claims discussed above.

Allowable Subject Matter

5. Claims 13 and 14 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

In regard to:

Claim 13:

The primary reason for the allowance of claim 13 is the inclusion of the limitation of wherein the height of the projections is substantially equal to the plane of the nozzle opening. It is this limitation found in this claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Claim 14:

The primary reason for the allowance of claim 14 is the inclusion of the limitation of wherein the height of the projections is below the plane of nozzle opening. It is this limitation found in this claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Response to Arguments

8. Applicant's arguments with respect to claims 1-35 have been considered but are moot in view of the new ground(s) of rejection.

Reference US 6,132,028, "contoured orifice plate of thermal ink jet print head" issued to Su et al., 10/2000 was used in this office action. The arrangements on top of the orifice plate read on the instant application, and their functionality for storing ink

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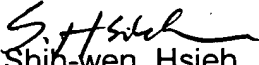
puddles through a capillary action of the top arrangements, such as the ridges in one of the embodiments shown in figs. 8 and 9 was used in this office action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-wen Hsieh whose telephone number is 571-272-2256. The examiner can normally be reached on 7:30AM -5:00PM.

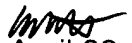
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, S D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SHIH-WEN HSIEH
PRIMARY EXAMINER


Shih-wen Hsieh
Primary Examiner
Art Unit 2861

SWH


April 29, 2006